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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/854,759	05/14/2001	Michael B. Ball	4589US (99-1151)	8899

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EXAMINER
HARAN, JOHN T

ART UNIT	PAPER NUMBER
1733	

DATE MAILED: 11/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/854,759	BALL ET AL.	
	Examiner	Art Unit	
	John T. Haran	1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4,6-13,15,17-23,25,27-33,35,37-45,47,49-51,53,55,56,76-84.* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1,2,4,6-11,23,25,27-33,35,37-45,47,49-51,53,55,56 and 76-84* is/are allowed.

6)☒ Claim(s) *12, 13, 15, 17-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/12/04 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 12, 13, 15 and 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto et al (U.S. Patent 6,342,434).

Miyamoto et al discloses a method for thinning and dicing a wafer wherein the wafer has a surface with bumps that is covered by an adhesive tape with an adhesive coated on a backing such that the adhesive conforms to the shape of the bumps and the backing remains planar, the wafer is mounted on a vacuum suction table such that the backing of the tape abuts the vacuum table and is held against it by suction, the other side of the wafer is then thinned to remove some of the wafer material while be held to the vacuum suction table, after thinning the adhesive tape is removed from the

wafer, and then the wafer is diced into individual chips (Column 18, line 7 to Column 19, line 22).

Miyamoto et al is silent towards applying the adhesive to the bumped wafer surface and then applying the backing to the adhesive, however Miyamoto et al does teach applying a resist to the bumped surface and then applying a backing to the resist (Column 17, line 60 to Column 18, line 6). Additionally, one skilled in the art would have readily appreciated that it is well known and conventional when providing a backing to an adhesive member that either the adhesive is applied to an object first and then the backing is applied or the adhesive is applied to the backing and then the adhesive is applied to an object. The two are alternative expedients and are obvious one over the other. It would have been obvious to one of ordinary skill in the art to provide the adhesive to the active surface of the wafer and then apply the backing in the method of Miyamoto et al.

Regarding claims 18-20, one skilled in the art would have readily appreciated that the original and final thickness of the wafer would depend upon the source material and the ultimate use of the wafer and that one skilled in the art would have been capable of adjusting the method of Miyamoto et al to thin any given thickness wafer to any given desired thickness. It would have been obvious to one of ordinary to have a wafer with an original thickness of at least 12 mil and to thin it to about 6 mils or below in the method of Miyamoto et al.

Regarding claims 21-22, one skilled in the art would have readily appreciated that grinding and chemical-mechanical polishing are well known and conventional

techniques for thinning wafers, as shown for example in Miyamoto et al (Column 1, lines 24-25). It would have been obvious to use conventional methods for thinning a wafer.

Response to Arguments

4. Applicant's arguments filed 11/12/04 with respect to claim 12 have been fully considered but they are not persuasive.

The phrase "a portion" does not positively exclude the entire bump being covered in adhesive and therefore Miyamoto reads on the claims.

Allowable Subject Matter

5. Claims 1,2 4, 6-11, 23, 25, 27-33, 35, 37-45, 47, 49-51, 53, 55, 56 and 76-84 are allowed.

6. The following is an examiner's statement of reasons for allowance:

Regarding claims 1, 23, 33, 45 and 51, the prior art of record fails to suggest the claimed methods, particularly the step of applying adhesive solely to a portion of the bumps or the front surface of a wafer.

Regarding claim 76, the prior art of record fails to suggest the claimed method of attaching a wafer having bumps on a surface thereof, particularly the step of attaching a tape having an adhesive and a backing on at least a portion of said surface having bumps thereon of said wafer, said tape contacting about 10% to about 60% of the surface area of said bumps.

As noted in Applicant's arguments filed on 7/16/04, Miyamoto et al teaches that the adhesive contacts the entire surface area of the bumps and the passivation film on

the surface of the wafer, which prevents warpage of the wafer during thinning from the release of the internal stresses in passivation film. While Satoh does clearly teach having an adhesive tape wherein the adhesive only contacts 10% to 60% of the surface area of the bumps (See Figure 1C), there is no motivation to modify Miyamoto to have the adhesive only contact 10% to 60% of the surface area of the bumps because then the adhesive would not contact the passivation film and the wafer would warp.

It is also noted that while Satoh does clearly teach having an adhesive tape wherein the adhesive only contacts 10% to 60% of the surface area of the bumps (See Figure 1C), the thinning process of Satoh results in the formation of separate dies without the need to cut the wafer after the thinning step because grooved were formed in the wafer prior to thinning and the thinning step removed enough material to reach the grooves leaving separate dies. There is no motivation to modify the method of Satoh to thin the wafer and then cut the wafer into individual dies.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **John T. Haran** whose telephone number is **(571) 272-1217**. The examiner can normally be reached on M-Th (8 - 5) and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (571) 272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John T. Haran
Examiner
Art Unit 1733